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ABSTRACT

The mathematical exercise of the the Prisoner's Dilemma is used to explore the issue of whether present models or paradigms of policy analysis cover the complete range of rational decision making. A review of the competing paradigms of the cybernetic concept, the analytic probability concept, and the cognitive categorization concept reveals additional, but unaccounted-for, policy-making behavior. It is this residual which is affecting educational governance systems, and it is referred to as extrarational phenomena. A conceptual and methodological exploration of the residual, extrarational phenomena is called for, and some suggestions for further efforts at analysis are provided. (CH)

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THE VIABILITY OF "EXTRARATIONALITY" AS A FRAMEWORK FOR EDUCATIONAL POLICY ANALYSIS

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THE VIABILITY OF "EXTRARATIONALITY" AS A FRAMEWORK FOR EDUCATIONAL POLICY ANALYSIS

I. INTRODUCTION

The viability of a framework for "extrarational" policy analysis rests upon the answers to two interrelated questions: (a) can a paradigm be constructed for the extrarational phenomena? and (b) of what practical use would such a paradigm be for educational governance? On face, the answers seem clear. Noted authorities (Rapoport, 1975), including the author who coined the phrase, "extrarational" (Dror, 1966), see no possibility of constructing a framework for analyzing this type of phenomena. At the same time, there seems obvious policy situations in educational governance which are in dire need of a conceptual framework to guide systematic analysis. Situations which lack stipulations of precedent or consistency for determining what is the "good" or "rational" decision occur in practice. Despite recognition of "watershed crisis" (Gross, 1966) or "extreme turbulence" (Friedmann and Hudson, 1974) policy conditions, the literature on nonroutine decisionmaking bypasses in-depth consideration of "extreme deviation" (Maruyama, 1962) issues.

The purposes of this effort are to explore the viability of a conceptual framework for the "extrarational" decision and to assess the potential for practical application of such a framework in a particular type of decision context. The specific vehicles utilized to guide this exploration[1] are: (a) the "prisoners dilemma" exercise (Rapoport and Chammah, 1965; Pilisuk, 1966) which forms the basis of Yehekel Dror's "extrarational" classification (1966, pp. 149-153) and (b) the "novel" or "unique" decision situation, which underscores the role of precedent and consistency in determining what is rational.

The data base for this study synthesizes the decision literature on individual, small group, and large organization policymaking with that of various "schools" of analysis (which are distinguished by assumptions of rationality). The blending of literature perspectives created several concentrations which are assumed to represent the major thrusts of current decision analysis. A paradigm is "a systematic statement of the basic assumptions, concepts and propositions employed by a school of analysis . . . considerably weaker than any satisfactory theoretical model . . . paradigm articulation is, of necessity, to caricature" (Allison, 1971, p. 32). Several "schools" of analysis which create paradigms of decision rationality are identified. An obvious subpurpose of this paper is to identify the extent to which rationality assumptions are fixed by the paradigm or conceptual framework of a particular "school."

II. THE PRISONERS' DILEMMA AND "EXTRARATIONAL" POLICY JUDGMENT

In 1966, Yehezkel Dror provided a survey of normative decision models purported to describe rationality: pure, economic, sequential, incremental, satisfying, and "extra." With the exception of extrarationality, the other models share the basic assumption that "pure rationality . . . achieved at reasonable cost . . . is the best method for decision making." (Ibid., p.149) With the exception of extrarational, the other models do not differ in their basic assumption about "what is rational" but rather in the way the various models estimate the practicality and justification for a rational policy in terms of "pure" costs and benefits.[2]

Extrarational is described as "subconscious" intuition and judgment. The extrarational phenomenon was selected as a focus for this paper because of two basic points made by Dror. First, Dror assumes students of policy

making have no means of passing judgment upon "intuitive" or "hunch" considerations. He writes, "The modern decision sciences, except for isolated cases, either disregard extrarational processes or consider them an unavoidable evil to be minimized . . . they either try to ignore the problem of extrarational processes completely or finish it off by calling it 'mysticism' (1966, p. 195). Dror's own position is clear: ". . . we have no way (emphasis mine) to compare the quality . . . since we don't know even that much [their net output in certain cases] we have no way even in theory (emphasis mine) to decide what their optimal role might be . . ." (Ibid., p. 151)

The second reason Dror was selected as the focus of this paper was the use of the "prisoners' Dilemma" as an example of extrarational policy.[3] As Dror states, it is a "thought provoking but clear cut case in which extrarational decision making are demonstrably better than pure rationality itself." (Ibid., p. 151)

A. The "Prisoner Dilemma" Example

The classical prisoner dilemma (hereafter PD) example was intended to mirror a police interrogation situation. Prisoners A and B have committed two crimes, bank robbery and car theft. They are picked up on suspicion, but the police have no definite evidence of the bank holdup. The prisoners are interrogated separately -- the crucial implication being that neither knows if the other has confessed. What each prisoner does know is the probable consequences of their joint responses: (1) if neither confesses they get light sentences on a reduced charge (the car theft is the lighter sentence), (2) if both confess they get medium sentences on the original charge (bank robbery), (3) if one confesses (i.e., turns state evidence), he gets off, but the other convicted for both crimes. A schematic illustration

of the dilemma is shown in Figure 1.

Figure 1

	B keeps quiet	B confesses to bank
A keeps quiet	Both one year for car theft	A gets three years, B gets off
A confesses to bank	A gets off, B gets three years	Both get two years for bank robbery

Assumptions: sentence for car theft 1 year, for bank robbery two years

The dilemma is that the assumed nature of competition inherent in rational choice (i.e., goal is to maximize personal gain) would make each prisoner in isolation of the other confess to robbing the bank. The assumed object of the game is to get more and avoid getting less than the other prisoner. By confessing, neither prisoner can do worse and may do better than the other. However, if both prisoners play an "extrarational hunch" and keep quiet then they have cooperated (even if in isolation) and this maximization of joint gains exceeds the individual reward/punishment calculation. The methodological "paradox" of why better choice outcomes could be the result of a "subjective" calculation, as opposed to the assumption of "rational" competitiveness, is an underlying subject of this paper.

B. "Prisoner Dilemma" Research Efforts

Extensive prisoner dilemma research has been done to try and determine the probability of actual prisoner choice being either cooperative or competitive. The results have been mixed (Nydegger, 1974; Sermat, 1970) and even strict adherents of analytic probability argue that the uncertain

findings are the influence of variable selection and not the values in the payoff matrix (Steiner, 1972). Although there are strong methodological arguments highlighting the dangers of generalizing from PD research to real life (Gergen, 1969; Nemeth, 1972),[4] systematic efforts in trying to establish probabilities of "extrarationality" detail the issues of choice consideration in a paradigm construction. Several PD researchers have concluded the effect of prisoner personality upon choice is influenced by such aspects as the view of human nature (Kelly and Stahelski, 1970), altruisism (Frohlich and Oppenheimer, 1972) and abstractness or concreteness of information processing (Schroder et al., 1967). Other PD researchers have analyzed the effect of interaction of personalities (Rapoport and Chammah, 1965), but this would have to assume (in our extrarationality example) that the prisoners were in communication.

As will be pointed out in section III, the analytic probability "school" (which does prisoner dilemma research) makes several assumptions about what is rational. Attempts to resolve the paradox of "extrarational" by establishing analytic probabilities have ranged from "meta game" (multiple play) considerations (Howard, 1971; Robinson, 1975) for stability to creating a decision calculus for Martin Buber's interpersonal phenomenology (Alperson, 1975).[5] However, the present state of "extrarational" research from this analytic perspective is best summed by Rapoport:

> "In some situations . . . equilibrium makes possible prescriptions of rational . . . it is possible to speak of game theory as a prescriptive or normative theory, a theory of how rational players should choose. However, in no context can game theory claim the status of a predictive or descriptive theory of how actual actors will choose." (1975, p. 206)

Thus, Rapaport supports Dror's earlier contention that there is no means to explore the theory of "extrarational" choice. The rest of this

paper attempts to explore whether the contentions are true because of paradigm limitations about the assumed meaning of "rational" or the phenomena of the prisoner dilemma choice context itself.

III. PARADIGMS FOR STUDY

One approach to identify the conceptual substructures underlying the idea of decision rationality is to describe the "regular and predictable characteristics inherent in a bundle of related assumptions which constitute basic frames of reference" and "ask and answer the (decision) questions: What happened, why did it happen, what will happen?" (Allison, 1971, p. 4) For this paper, rationality will be discussed through the identification of three "schools" of policy description, each based upon the "working assumptions" of what Kuhn calls paradigms (Kuhn, 1959, 1963).[6] While the working assumptions are not necessary in any objective, incorrigible sense (and there is a residual vagueness because it is often not feasible to list assumptions exhaustively) their significance is in providing a "coherent intellectual framework which is apparently a necessary ingredient for organized scientific endeavor." (Steinbruner, 1974, p. 10) It is further pointed out by Kuhn that the distinguishable assumptions of a particular "school" are not generally called to question in scientific research but, rather, implications are worked out with consistency and care within the governing frameworks. This paper identifies several paradigms or frameworks for interpreting "evidence" in the study of decision rationality. As such, the landmark works of Graham Allison (1971) and John Steinbruner (1974) are duly noted as providing a major influence in the construction of this comparative effort. Thus, the major approach to paradigm classification is based upon the form of underlying

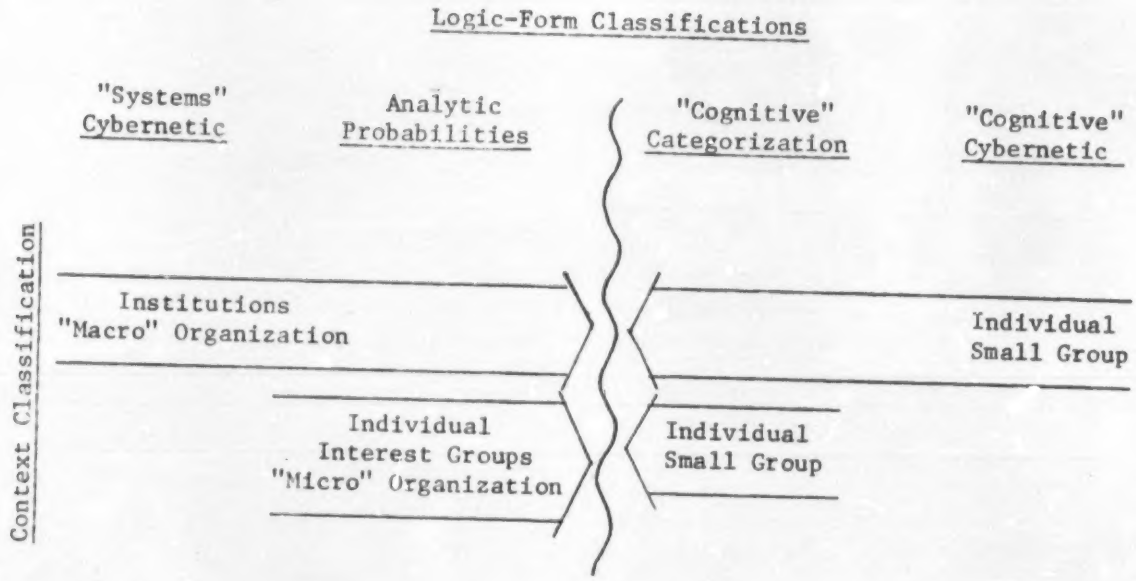
logic for determining what is rational.

A second interrelated classification scheme is based upon the primary decision context. While the source of a particular decision context emphasis is often influenced by the analytic assumptions of the research focus (i.e., political, sociological, psychological), there seems a pervasive and "natural" distinction between the formal institution and the individual policymaking (Etzioni, 1968). For example, the small, face-face group is often discussed as the middle or mediating point between institution and person (for a variety of approaches to this discussion see Verba, 1961, and Allison, 1971).

Attempts to describe complex policy matters by focussing upon decision "subsystems" or contexts (i.e., Horwitz, 1953; Singer and Ray, 1966) have tried to delineate rationality by either the actions of a single chief actor or through small group behaviors or formal, organizational role stipulations (See, for example, George, 1974, pp. 176-245.). However, there is general awareness that the linkage and synthesis of "ego psychology, small group dynamics and organization behavior research[by itself] is primitive . . . and study reduced to successive approximations" (Ibid., p. 179).

This paper approaches the paradigm classification of rationality by combining the logic of form and the focus on particular decision contexts. Figure 2 schematically illustrates the resulting framework for study.

Figure 2



The large arrows indicate context thrusts in the decision literature which provide different perspectives to the central consideration of this paper; the special situation of the "extrarational" decision.

A. The Cybernetic Concept

The cybernetic paradigm is concerned with one specialized subset of policy, the most pertinent work being done in fields such as psychology of learning, perception, linguistics, logic, epistemology, and information theory. The logic of cybernetics is confined to simple decision mechanisms in highly structured, appropriately arranged policy environments. Further, cybernetic logic does not consider the ability of an organization or person to make inductive inferences of its own initiative. Common examples of the cybernetic policy mechanism are the room thermostat or the automatic pilot in an airplane. There are four crucial assumptions in describing decision rationality according to the logic of cybernetics. First, once established as servomechanism, variety (i.e., "uncertainty") is not confronted as an

issue, for there are no new calculations of the environment. The cybernetic mechanism merely tracks a few feedback variables (Steinbruner, 1974, p. 57).

Secondly, cybernetics has a "process" focus of decision reality (Simon, 1968, pp. 84-118), which resembles a recipe rather than a blueprint. Details of the operation (which when performed will produce the desired object or situation) are known, yet the mechanism operates without any clear picture or "interest" in the actual product. For this paper, the cybernetic interpretation of rationality would not assume the "purposive" nature of choice except as purpose was set outside or before the particular decision situation under consideration (i.e., See Allison's "t-1" discussion, 1971, p. 91.).

Third, success of a cybernetic action depends on the character of the surrounding environment. Ashby (1952, p. 93f) argues that "lethal" discontinuities will defeat the adaptive capacities of even the most "ultra-stable" system. The key assumption in cybernetic logic is that complex policy considerations can be "decomposed" to a point that potentially lethal variation will be stabilised within subsystems of the total, hierarchically arranged possibilities.

Fourth, implementation of cybernetic logic assumptions in complex policy systems (what Alexander, 1964, calls "unselfconscious processes") may create the "overmanaged" (Etzioni, 1969) stable state. The epistemological foundations of cybernetic techniques and the relation to moral intent of the policymakers responsible for "programming" guidance mechanisms has become a topic of keen interests in this decade (Friedmann and Hudson, 1974; Churchman, 1971; Ellsberg, 1973).

Application of cybernetic logic to the cognitive processes of an *individual* would closely allign with Skinner's (1957) theory of operant conditioning. Although Skinner was delineating the learning mechanisms for language acquisition, his paradigm assumptions could provide a cybernetic framework for decision analysis.

At the *small group* level, a variant of cybernetic assumptions is presented by Janis (1971) in his consideration of the conformity mandates necessary for cohesion in stressful environments. Looking at group concurrence as a regressive form of thinking, Janis argues "groupthink" (the shared illusion of invulnerability through unanimity) leads to the following characteristics: global and undifferentiated thinking, dichotomized modes of thought, oversimplified notions of causation, loss of sense of proportion, confusion of means with ends (Ibid., Ellsburg, 1973). To the extent that these small group characteristics occur automatically under stress demands, it can be argued they act as servomechanisms in policy adaptation attempts. (See later discussion of cognitive categorization for another interpretation.)

In terms of the prisoner example, there is no dilemma when ". . . the decisionmaker, primarily and necessarily engaged in buffering himself against overwhelming variety . . . simply avoids direct outcome calculations. Such a decisionmaker possesses procedures for processing information which, in fact, generate decisions . . . but psychologically he is not engaged in the pursuit of an explicitly designed result" (Steinbruner, 1974, p. 66). A practical example of the cybernetic referrent might be if both prisoners were hardened, "three time losers" so that admission to any crime would mean an automatic life sentence. Under this condition, the rationality of "clamming up" would probably not entertain the purposive issues of crime intensity on whether his partner would "squeal." This referrent would correspond to the person

"cognitive cybernetic" category in Figure Two.

The counterpart to cognitive cybernetic is labelled "systems" cybernetic in Figure Two. The organizational application of cybernetic logic has both formal and informal dimensions. The formal specification is the bureaucracy (Weber, 1947), where policy tasks and choice relationships are predetermined; fixed according to formal rules and standard operating procedures (leading to the achievement of the total organization's purpose). While the ideal model of bureaucracy assumes a perfect hierarchical arrangement of policy complexities, in reality, formal stipulations usually affect institutional subsystems. (Allison, 1971, p. 67)

The application of cybernetic logic is also found in the established policy routines and standard operating procedures of the informal organization which permeates the bureaucratic structure. The "system" cybernetic of an institution's formal and informal routines are usually found in "clusters bound up together to form what are called (in government) programs" (Steinbruner, 1974, pp. 71-72). Programs are rarely tailored to a specific situation and act more as a series of procedures to provide general adaptations.

Finally, institutions establish repertoires for standard scenario response that the organization has defined (Allison, 1971, pp. 83-84). The established standard operating procedures, programs, and repertoires act as servomechanisms within the organization to limit "choice" to the first adaptation which is identified as acceptable to satisfy cybernetic objectives. Cyert and March (1963) state that complex organizations exhibit policy characteristics that promote the cybernetic logic. Two specific characteristics are uncertainty avoidance and problemistic search.

The extent to which systems cybernetic logic permeates the policy environments of large organizations can only be speculated. Lindblom (1959)

argues that basic allocation patterns, once established, account for 95 percent of policy choice flexibility.

For this paper, it seems clear that many policy situations fit the cybernetic logic of rationality, but that the certainty of "choice" (i.e., automatic adaptation) makes the prisoner's "dilemma" a moot question. An organizational example of cybernetic logic as it affects a "prisoner" might resemble Franz Kafka's The Trial where punishment is perceived in all options.

B. The Analytic Probability Concept

As established earlier, the concept of analytic probability calculation by a policy actor underscores Dror's discussion of prisoner. The basis of calculation (i.e., criteria to establish a good or rational decision in terms of whether to confess) is the source of the "dilemma." The core of the issue is the analytic assumption that decision rationality is (a) a function of purposive choice that is highly self-conscious (Alexander, 1968) and (b) capable of establishing probabilities of outcome among a variety of options (Becker and McClintock, 1967). Implicit in this stance is the assumption that the actor is capable of competitive inferences upon his or her own initiative. Specifically, the concepts of consistency and precedent in probability setting are assumed through actor desire to maximize value (utility), given constraints of a situation.[7] (Luce and Raiffa, 1957) However, lacking a universal, objective, and independent means to establish utility values (i.e., love or sense of dignity which cannot be included in conventional competitive pricing calculations of the marketplace) the analytic paradigm assumes the individual determines relative value calculations of benefits and costs. "Thus in the two-value, trade-off situation (i.e., 'to confess or not') . . . the individual (each prisoner) integrates the separate dimensions

of value by setting up a tacit metric capable of comparing values . . . relative allocation is often graphically displayed by positing a set of indifference curves . . ." (Steinbruner, 1974, p. 29) In other words, to approach the prisoner's dilemma from the analytic perspective "the competing claims of the values directly and immediately presented in an output trade-off relationship are weighed against each other and some deliberate balance is produced." (Ibid., p. 31)

Attempts to calculate the meaning of "deliberate" in probability assignments has spawned the field of gaming theory as a branch of formal mathematics (See, for example, Raiffa, 1968, and Rapoport and Chammah, 1965.) or considerations of counter intuitive strategies (Wilkinson, 1973).[8]

Although a paper addressing the "extrarational" state of two separated prisoners would be limited to individual actor calculations from the competitive paradigm, it should be pointed out that logic problems compound with the collective decisions of multiple actors. Logical conceptions of individual utility (such as the Pareto criterion that a decision be taken if some people's values will gain and everyone else is at least as well off) do not hold when one person's values must be traded off against another's, thus hindering a process of aggregating the separate calculations of analytic actors under trade-off conditions. In effect, different utility "rules" govern collective policy efforts (Olson, 1965). Allison (1971) has attempted to delineate the increased complexity through this bargaining model; directing attention to such topics as the effect of parochical priorities and perceptions, the stakes, deadlines, power ("an elusive blend of bargaining advantages, skill, and will to use and other players' perceptions of the ingredients," Ibid., p. 168), action-channels and rules of the game. Specific variables of increased complexities are covered with such distinctions as "where you stand depends on

where you sit" and the "chiefs and the Indians." (Ibid., pp. 176-177)

C. The Cognitive Categorization Concept

As stated earlier, cognitive processes can be assumed to be a cybernetic function of operant conditioning (Skinner, 1957) or group conformity mandates operating at such a level of intensity that policy considerations automatically follow "groupthink" prescriptions (Janis, 1971). In either case, cognitive is not interpreted as a purposive choice but rather a maintenance function of previously determined policy directions.

At a second level, many writers of the "psychological" school who attempt to describe the cognitive processes of decisionmaking assume the analytic calculation of probabilities based upon standards of utility (Tiedemann and O'Hara, 1963; Vroom, 1964; Jepsen and Dilley, 1974). This assumption (which underscores classic decision theory) is consistent with the analytic perspective of the prisoner dilemma example presented in section two.

There is, however, a third strain of writing that suggests a cognitive perspective to the study of how decisions are made. Chomsky (1964, 1959) has argued that the inherent capacities of the mind allow an inferential structuring of ambiguous data. For example, there are both lateral and hierarchical associations in memory (Neisser, 1967) which act as a "fundamental force in the decision process" (Steinbruner, 1974, p. 90). The assumption of memory in establishing basic structures or rhythms of cognitive organization is supported by three other assumptions about how a decider thinks. A second principle of this cognitive perspective is that inference capacity is constrained by striving for consistency in internal belief relationships.[9]

A third assumption is tied to the "reality" principle of Sigmund Freud, which hypothesizes that stable, important features of the environment

impose themselves quite reliably on the mind. Perhaps the most questionable extension of this reality assumption (yet one crucial to the development of this paradigm) is that "many features of the environment are clearly enough presented that virtually any given individual will perceive them in substantially the same way" (emphasis added) (Ibid., p. 101). To this point, it should be obvious that the reality principle has application to the analytic paradigm presented earlier. However, this perspective assumes that the reality structures imposed to resolve uncertainty are not probabilistic judgments but *categorical* inferences.[10] Steinbruner sums up the basic assumption of this perceptive to decision reality, "The mind constantly struggles to impose clear, coherent meaning on events, uses categorical . . . judgments and thus expects to anticipate outcomes exactly (emphasis added) rather than assign probabilities to a range of outcomes" (Ibid., p. 112).

Paradigm assumptions which present deciding as a function of a person's beliefs (which are constrained by internal consistency mandates) needs further clarification. This perspective argues that the criteria for categorical selection will be governed by simplicity and stability (Ibid., pp. 101-103). The outcome of implementing these criteria creates a strong corrollary assumption that value integration occurs "even when the decision maker is unaware of it and does not consciously try to do it. However (important for our prisoner dilemma focus), integration is not the only pattern of human inference in trade off . . . and tends not to occur under conditions of intense uncertainty . . ." (Ibid., pp. 104-105). In the uncertain situation, consistency mandates assume elimination of tradeoffs in a person's belief system (eg., the analytic "choice" of trade offs cannot occur. Psychology consistency assumes a single governing set of beliefs.[11]). Thus, to understand a prisoner's decision choice in the uncertainty of the

dilemma situation, a researcher must know the stable pattern of beliefs which govern consistency for the particular prisoner. As beliefs are often unconscious, and depend upon inferences to other established beliefs rather than direct evidence, this paradigm may specify an unresearchable perspective. A possible method to ascertain a person's belief structure would be to analyze cognitive mechanisms responsible for inconsistency management. Possible mechanisms include: (a) use of images and arguments from analogy, (b) inferences of transformation (i.e., what considered in a long-range time frame), (c) inferences of impossibility and (d) negative images (Ibid., pp. 114-120). If a prisoner's mechamisms to maintain belief consistency were known, a categorical hypothesis of dilemma response could be calculated.[12]

D. Summary

Review of possible paradigms to approach the "extrarational" phenomena reveal several similarities, regardless of logic form or decision context emphasis. The basic similarities are the functions of precedent and consistency to approach the issue of rationality. The most obvious example of these inherent assumptions is the cybernetic paradigm. The servomechanism assumes the choice situation is predetermined, and the mechanism for adaptation is incapable of inductive inference upon its own intitiative. The very meaning of rationality is tied to the servomechanism ability to act according to precedent in a consistent manner. Other choice considerations are moot questions. From this perspective there is no dilemma. The prisoners either act rationally according to preprogramming or the situation, by definition, is impossible.

The analytic probabilities paradigm, which is the basis of Dror's discussion, again demonstrates the latent assumptions that precedent and consistency to determine rationality. "Extrarationality" arises from two

interrelated problems in the methodological translation of consistency-precedent assumptions. Foremost is the problem of an assumed standard by which utility probabilities can be judged. It is difficult to assume consistency and precedent on one hand then admit that personal choice parameters based upon relative, tacit, "subjective" considerations may introduce novel choice options "outside" established possibilities (i.e., noncompetitive action). Bluntly, if choice inferences on an actor's initiative allow "unique" options which violate standards of what is assumed precedent or what is assumed consistent, then the very assumptions of what is considered rational are called to question (See, for example, Liska, 1975.).

The cognitive categorization paradigm also assumes precedent and consistency in juding rational choice. In this case, the standard is the "stable set of beliefs," based upon memory associations, strivings for consistency, simplicity and stability and the "reality" principle which assumes important features of the environment will be identified "reliably." Because of the consistency and precedent of a person's belief pattern decision choice possibilities can be anticipated exactly.

It seems clear that each of the three conventional paradigms of policy choice would address the issue of "extrarationality" as (a) unsolvable and, thus, irrelevant or (b) a needed refinement of existing conceptual and methodological techniques. However, another option can be speculated by addressing the assumptions of consistency and precedent through the vehicle of the "novel" decision condition.

IV. THE NOVEL CONDITION

Within the literature, there is reference to certain decision making conditions that violate the legitimacy of assuming consistency or precedent

to analyze rationality. The novel or unique decision situation has been hinted at in a variety of ways and its characteristics are uncertain. From the cognitive literature there is reference to "situations where mental operations and cognitive structures required to make trade off problems explicit dissolve and violate the conventional assumptions of psychological consistency . . ." (Steinbruner, 1974, pp. 103-112; Becker and McClintock, 1967, pp. 239-286). From the organizational literature there is discussion of extreme turbulence conditions ". . . when the problem is not uncertainty . . . but the certainty that current knowledge will misstate the nature of conditions tomorrow . . . when the problem cannot be solved by greater computer capacity to augment our brainpower . . ." (Friedmann and Hudson, 1974).

Despite continued recognition of distinctions between "regular" and "watershed" crisis conditions (Gross, 1966), much of the literature on "nonroutine" decision making (for example, March and Simon, 1959) bypasses indepth consideration of "extreme deviation" situations. Perhaps because of rationalist assumptions, the crucial organizational phenomena of feedback which amplifies deviation has received only passing interest (Maruyama, 1962).

In this paper, the possibility of choice conditions where received information either heightens confusion, increases "crisis" feeling or establishes certainty that existing data base is "wrong" so that novel policy action is taken without precedent or consistency is assumed. Allison (1971, p. 85) hints that, within organizations, these conditions are most likely to occur in times of extreme budget feast, budget famine or dramatic performance failure.

To obtain clues to the meaning of prisoner dilemma when assuming a novel condition, I will take license to modify Dror's assumptions (deliberately taking certain ideas from their original discussion context). A possible

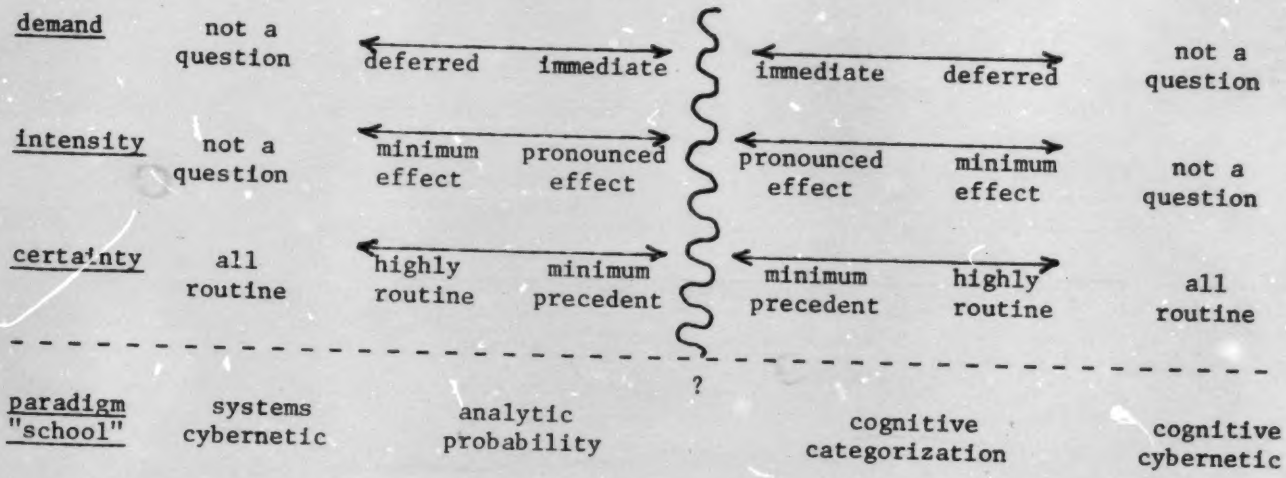
example of a "prisoner" situation somewhat analogous to novel conditions would be two young teenagers picked up for crimes the police "know" (without concrete evidence) they committed. Novel could only be argued if the teenagers' background had no previous experience with the purported crimes, jail conditions, or police suspicion mentality. Whether the reader is convinced this makes a "unique" decision situation is less important than to highlight the different meaning of precedent and consistency vis-a-vis rational choice when compared to the example of hardened "three time losers" presented previously. The difference is emphasized by the extent of assumed certainty and/or stability between the decision mechanism (prisoner) and the perceived conditions for adaptation. In the teenager case, no servomechanisms were established prior to the arrest. There is no previous data base to establish analytic probabilities of what "confession" means. Finally, there is no stable pattern of beliefs, for this experience is assumed completely antithetical to their upbringing (a condition which many parents and/or teenagers will find hard to digest).

As an initial step toward the construction of policy hypotheses about novel rationality, typologies of issue condition and adaptive response are explored.

A. Issue Typology

Perspectives about the type of issue context which assumes precedent in choice were selected from the various paradigms under study. Figure 3 schematically illustrates the conventional issue contexts established when demand for adaptation, intensity, or effect on basic allocation/legitimacy and predictability or consistency are varied within the assumed t-1 framework.

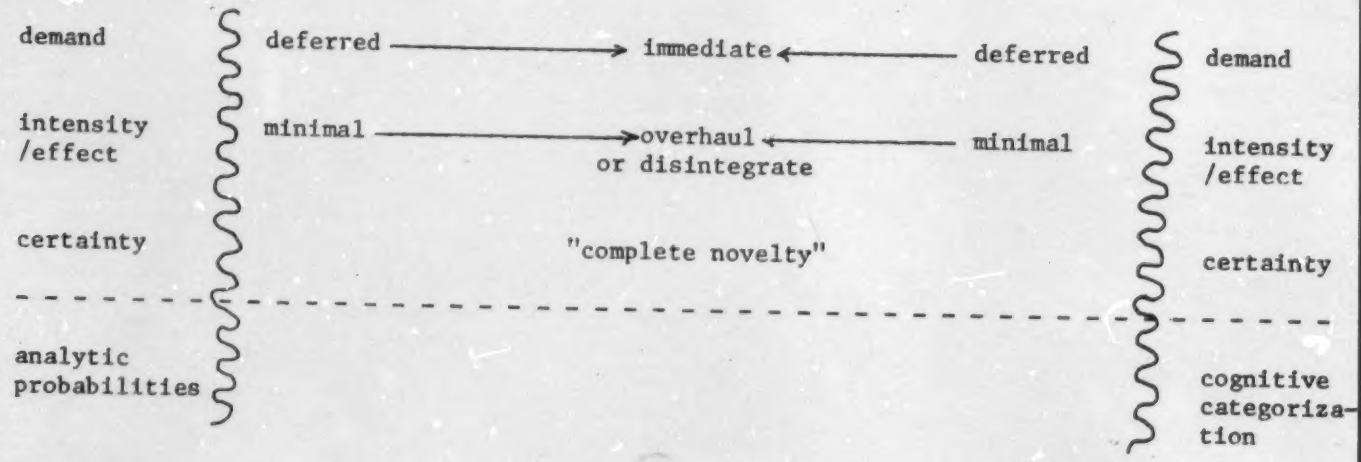
Figure 3. Conventional Issue Contexts



In this illustration, the demand for an adaptive decision varies from a moot question in the cybernetic paradigms to a variable of "deferred to immediate" for the analytic probability and cognitive categorization paradigms. The same type of distinction is presented for intensity and certainty of a specific issue context. In each continuum of Figure 3, the bodies of decision literature have data to contribute to our understanding. However, as the continuous approach the wavy line in the center of Figure 3, the data become sketchy. This wavy line represents the "novel" issue context.

Figure 4 presents the hypothetical extension of conventional issue context when the continuum of Figure 3 are considered as framework.

Figure 4. "Extrarational" Issue Contexts



In this illustration only the certainty category has a single classification of non-precedent and lack of consistency. However, even in the "first time" decision arena, the considerations of intensity/effect and demand for adaptation are perceived as continuous. By varying these considerations three basic types of "non precedent" issue contexts (where "novel" decision making might occur) are created.

The least radical type of non precedent context would be the "new" policy alternative derived from a rearrangement of present decision dynamics. The "new" alternative version of a non precedent issue context could occur as a result of sequential rationality (Dror, 1966) conditions. If a body invested certain resources to initiate explorarotyr probes to "find new knowledge" for decision making, the discovery of "new" alternatives (eg., not "logical" extensions of precedent or criteria of certainty) is possible.

A second, more radical type of non precedent issue context is the "vacuum." The vacuum may be created when the organizational or cultural overlap of various components of a policy mechanism leave logical (i.e., impossible to rationalize "fit") gaps in explaining interrelationships. For example,

Dror (1966) discusses the possible arrangements of simple and complex hierarchies as well as polycentric organizations with few and many autonomous centers. It may well be that the interrelation of some or all of these arrangements within and/or between policy organizations with few and many autonomous centers. It may well be that the interrelation of some or all of these arrangements within and/or between policy organizations creates precedent "vacuums." Vacuums may affect either decision formation or implementation mechanisms. If the underlying organizational assumptions of hierarchical and polycentric rationality are extremely deviant and forced to be considered under "crisis" decision conditions there may be a vacuum of decision novelty.

The third and most radical type of uncertain issue context would be the "doomsday" condition: "when the problem is not uncertainty . . . but the felt certainty that current knowledge will mistake . . . conditions . . ." (Friedmann and Hudson, 1974). Doomsday conditions would exist if the policy mechanism felt that present adaptive responses would lead to automatic failure. In this version of a non precedent issue context, there seems to be a further logical distinction based upon the extent of failure. Failure of the basic allocation patterns or rationale for legitimacy leads to extinction of the policy mechanism (Miller, 1965). There would also seem to be the possibility of novel failure conditions which do not cause the extinction of the total policy mechanism. As an example, assuming Lindbloom's (1959) muddling argument, a complex policy organization can make only marginal adjustments (5 percent), once basic allocation patterns are established. If extensive change raised the issue of total organizational extinction, then less than five percent failure could raise "doomsday" considerations for subcomponents within that percent. In other words, "doomsday" extinction possibilities could create the novelty of an unprecedented "overhaul or disintegrate" (Vonk, 1973) choice

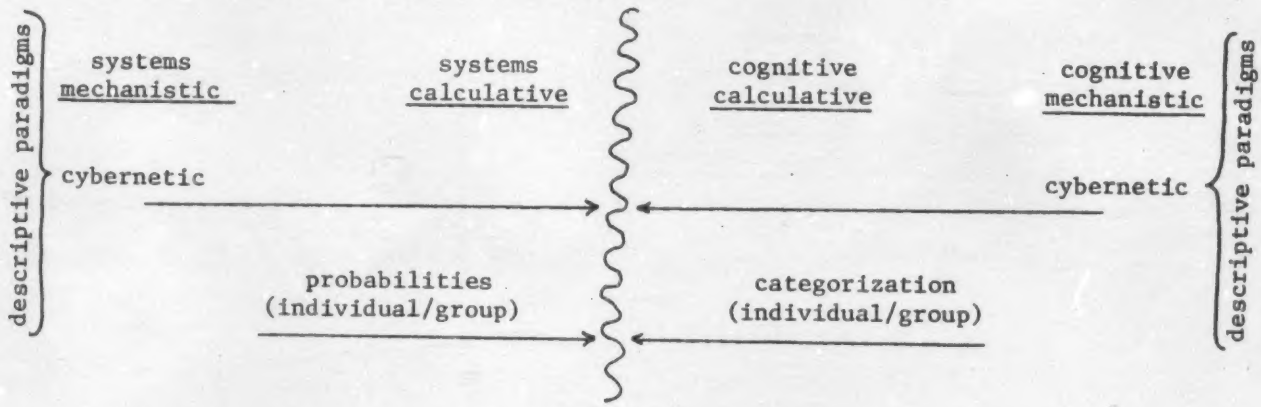
for part or sum of a decision mechanism.

It would seem possible to establish other types of novel issue contexts. However, the point of this effort is to establish the plausibility of paradigm construction of nonprecedent decision conditions.

B. Adaptation Typology

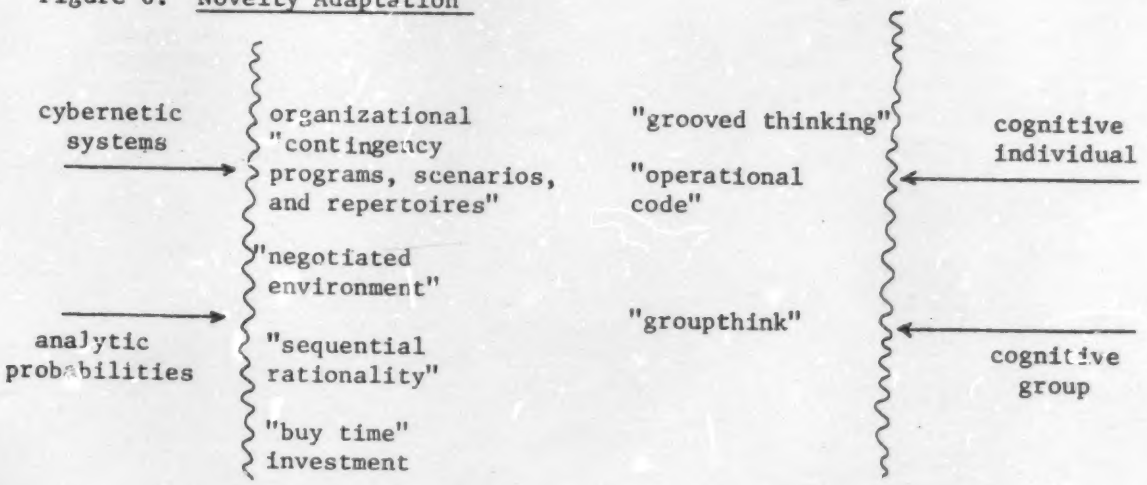
As with the "wavy line" of figures 3 and 4 where demands have no precedent, there are also clues to possible types of novel adaptation. Figure 5 outlines the thrust of the various conventional paradigms toward the idea of adaptation.

Figure 5. Conventional Adaptive Mechanisms



Again, the wavy line in the center of the illustraiton indicates that adaptation under novelty may exceed the conventional knowledge of cybernetics, analytic calculation, or cognitive categorization literature. However, a "borrowed toolbox" approach to the conventional literature lends valuable clues to possible identification. Figure 6 illustrates some hypothetical extentions of conventional paradigm thinking and key words from the literature used to indicate the areas of most promising study of novelty adaptation.

Figure 6. Novelty Adaptation



What the conventional literature on adaptation presents are various interpretations about how conditions can be minimized. Figure 6 outlines what the various paradigms suggest might happen in novel decision conditions. In each case, the attempt to re-establish a precedent and/or consistency context is the overriding criterion of adaptation.

From the perspective of systems cybernetics, Allison describes mechanisms of uncertainty avoidance. "Organizations to not attempt to estimate . . . future occurrences. Rather, organizations avoid uncertainty by arranging a negotiated environment . . . stabilizing the primary environment with agreed budgetry splits, accepted responsibilities and established practices . . . and the secondary environment by alliances with friends and 'precarious status quo' contracts with enemies. When the environment cannot be negotiated . . . standard scenarios are prepared for uncertain contingencies . . ." (1971, p. 84).

Literature addressing the establishment of analytic probabilities suggests several alternatives to deal with extreme uncertainty. Dror (1966) cites Burton Klein's military research and development model of sequential

decisioning as a way of delaying choice considerations until enough information is learned. "When initial uncertainty is high . . . and time a premium, then the sequential decisioning can be an important guide to time experimental policies and delay decision on one definite policy. (Ibid., p. 143)

A variation of sequential delay is the negotiated "poker game" type of choice environment (Allison, 1971, pp. 170-179) which affects the potential pace, structure, and laws of an uncertain "game."[13] High choice uncertainties influence misperception, misexpectation, and miscommunication. Allison infers that a strategy of "stabilizing" a novel bargaining arena may call for the systematic support of the above influences until precedent can be established.

Gaming literature has also approached the issue of novelty by study of such situational variables as time given to make a decision (Lave, 1965), manipulation of information about a choice situation (Nydegger, 1974), fear of failure (Bierney and Stillings, 1967), and temporal organization constraints (Grey, 1975). However, due to the extreme differences in experimental format and rationalistic assumptions of personality as a decision phenomenon, this focus seems reduced to "rules of thumb" (Baumol and Quandt, 1967) for adaptation.

The cognitive theory literature of how an individual adapts to highly uncertain choice situations suggest that "when an emotional state becomes too intense . . . the person will become emotionally disorganized or will resort to habitual defenses" (Janis, 1974, p. 166). Study of individuals under war and natural disaster conditions (Grinker and Spergel, 1945) of unknown choice suggest an adaptive reliance upon an "operational code" (Leites, 1953) of rules which are applied automatically and mechanically to decision making. George (1974) outlines eleven "codes" which provide "a set of general beliefs about fundamental issues of history and central questions of politics as

they bear . . . upon knowledge or action." (Ibid., p. 188) Although not thoroughly researched, the cognitive literature about individual deciders suggests a necessary reliance upon precedent, even to the point it departs from reality. Steinbruner (1974) describes this phenomenon as "theoretical thinking" which "buffers a person from the impact of uncertainty by establishing his belief system independent of reality . . . with beliefs established in a long range framework and well anchored, his inference management mechanisms are able to handle the pressure of inconsistency in any short-term situation." (Ibid., p. 132)

The final body of literature about adaptation to novel choice comes from the study of small, informal groups. Of particular interest is the hypothesis of "groupthink" normas (Janis, 1963) established in times of high uncertainty and crisis. Concurrence seeking to cope with stress tends to replace reality testing of the morality and efficacy of a policy consideration and forms an "emotional inoculation" against uncertainty. Thompson (1968) supports this contention of "clubbish need" to "domesticate" the deviant group members and neutralize the devil's advocate. This liaterature suggests novelty affects small group conformity as a function of cohesion in stressful environments.

C. Hypotheses About Novelty Adaptation

This section has attempted to establish the argument of consideration of choice paradigms for conditions of novelty. Clues to a "prisoner's dilemma" under conditions lacking precedent or consistency referrent were discussed from an issue context and what existing paradigms hint as adaptive response. Based upon the above discussion, two opposing hypotheses can be offered to "predict" a prisoner's "extrarational" reaction to novel choice:

wait for the familiar or act insane.

Wait for the familiar (to establish precedent or consistency standards for choice) is what the literature suggests the prisoner would do. This action is analogous to Fenno's (1959) description of Coolidge's "calculated inactivity." The strategy is to "sit down and keep still . . . to remain silent until an issue is reduced . . ." (or in this case clarified). This is one hypothesis about extrarational "hunch" which has special relevance in uncertain issue contexts where demand for adaptation is deferred and there is little intensity (Withey, 1962).

However, uncertain issue contexts can also be characterized by high demand and high intensity and suggest a second hypothesis of extrarationality. This is the hypothesis that the prisoner will act in a "new" choice manner. "New" is, by definition, "irrational" or "insane" (Laing and Esterson, 1971) activity according to the various precedent assumptions discussed previously. The second hypothesis of "new" choice is most likely to occur in extreme cases of fear arousal. Janis (1967) suggests that the relation between intensity of fear arousal and adaptive coping responses is an inverted U-shaped curve. "Moderately fear arousal . . . acts as an emotional inoculation enabling normal (emphasis mine) persons to increase their tolerance for stress" (Ibid., p. 232). Under extreme fear conditions, an extension of the literature on cybernetic, analytic, and cognitive response would seem to infer a "wait for the familiar" choice. However, we do recognize the "deviant" actions of those who "run amuk" as social phenomenon. I am suggesting the hypothesis that extrarational choice under extreme fear conditions could include running amuk or acting "insane." This would assume the lack of cybernetic, analytic, or cognitive mechanism to determine "better" for a given situation. Further, it is even possible to suggest three explanatory paradigms of the "insane" hypothesis. The first would

be a metaphysical standard of individual "morality" (i.e., the action is in relation to some personalized "modelling" referrent but not with society's). This could be a variant of Steinbruner's (1974) "theoretical thinking" or George's (1974) "operational code."

A second negative paradigm could explain the "new" prisoner action as an unknown, latent desire for self destruction (eg., suicidal behavior for ego survival).

The final paradigm to rationalize the insanity hypothesis would look to parapsychology and such explanations as "a psychic premonition toward cosmic energy."

D. Summary

It seems clear the possible frameworks to explore the idea of "extra-rational" choice can be created. Further, the problem is less with the "prisoner choice" phenomenon as with the conceptual lens assumed to judge its rationality. This section on the novel choice condition demonstrates the strong dependence of the cybernetic, analytic, and cognitive paradigms upon precedent and consistency to establish what is rational. However, even in conditions of non-precedent and extreme fear arousal, choice as "survival" adaptation can be rationalized by the construction of hypotheses and supporting paradigm possibilities. Hopefully, this paper has provided initial directions toward further efforts at systematic analysis of "subjectivity" in choice and uncertainty in "turbulent" issue conditions.

V. PRACTICAL APPLICATION

The final consideration of extrarationality as a viable concept deals with its usefulness. If extrarational is confined to a "mysterious"

mathematical game the practical value is confined to the researchers who derive aesthetic appreciation from such exercises. In the same vein, if this modification of Dror's original discussion is exclusively a study of theoretical possibilities, then its practical value for educational governance is most limited. However, it seems to this author that subjectivity and turbulence are increasing dimensions of decisionmaking in schooling. To ignore this area of choice because it is mysterious to conventional paradigms or to treat extrarationality exclusively as a metaphysical concern[14] seems unnecessary. The big city superintendency, the inner city principalship, the crisis collective negotiation situation seem to provide obvious starting points to explore various meanings of rationality. Similarly, the policy implications of a federal receivorship of schools in non-compliance of desegregation mandates may provide the "extremely turbulent" conditions for non-conventional paradigm considerations. Hopefully, the extensions of extra-rationality will provide a viable framework to approach these topics.

NOTES

1) In the interest of exploration this effort is approached in a "playful" manner (March, 1972, pp. 413-429). Playfulness is the deliberate, temporary relaxation of rules to explore the possibilities of alternative rules. In this case, the assumed necessity of precedent and consistency is relaxed to explore possible meanings of "extrarational" choice. A nonplayful approach to this particular topic would seem to support Myerson's contention: "Only the stoical and cynical can preserve a measure of stability: yet stoicism is the wisdom of madness and cynicism the madness of wisdom." (1971, p. 113)

2) Dror (1966) defines pure rationality to include six phases:

   a. Establishing a complete set of operation goals, with relative weights allocated to the different degress to which each may be achieved.
   b. Establishing a complete inventory of other values and of resources, with relative weights.
   c. Preparing a complete set of the alternative policies open to the policy-maker.
   d. Preparing a complete set of valid predictions of the costs and benefits of each alternative, including the extent to which each will achieve the various operational goals, consume resources, and realize or impair other values.
   e. Calculating the net expectation for each laternative by multiplying the probability of each benefit and cost for each alternative by the utility of each, and calculating the net benefit (or cost) in utility units.
   f. Comparing the net expectations and identifying the alternative (or alternatives, if two or more are equally good) with the highest net expectation.

   The four variants of pure rationality are described as:

   The economically rational model deviates from pure rationality because it accepts the restraints that limited resources put on trying to achieve pure rationality. The sequential-decision model in effect proposes a new type of policymaking strategy to be considered by pure-rationality and economically rational standards. The incremental-change model deviates from pure rationality on the grounds that innovative policies are necessarily risky and unpredictable, and that the unexpected results of such policies will likely be very costly. The satisfying model deviates from pure rationality on the grounds that, for social-psychological reasons, policymakers do not look for new alternatives after they have found one they consider satisfactory. But all these models are clearly derived from the pure-rationality model, are themselves justified in terms of "pure rationality," and are presented as realistic second-bests to the unachievable ideal, pure rationality. (Ibid., 1966, pp. 132, 134, 149)

3) Practical limits of this paper preclude discussion of the extrarational dilemma beyond the two-person game assumption. For a good discussion of the choice complexities added by aggregate achievement, see Dror's delineation of major types of relationships between policy units: simple and complex hierarchies and the polycentric structure with many and few autonomous units (1966, pp. 203-209). Hopefully, this paper addresses inferentially the application of such relationships to different policymaking phases, issues, and circumstances.

4) The lack of "real life" contention is even more significant for this paper because the challenge is made to constraints within the assumptions of the analytic probability paradigm.

5) Using a Boolean algebra of logic proposition to create the equivalent of an electrical circuit network (assumed bi-stable and parallel) which greatly reduces the data burden of calculating interpersonal perception. However, Alperson does note that perception of importance or trivialness must be known beforehand to avoid "a great deal of noise." (1975)

6) The popularity of Kuhn's ideas and the growing misuse of his original meaning of paradigm in social science application caused him to introduce a new notion, "disciplinary matrix," in 1970 (See the excellent discussion of Heyl, 1975.)

7) The simplist and strongest transitive relation is one which is well ordered in the mathematical sense; if A is preferred to B and B preferred to C, then A must be preferred to C. See Steinbrumer's discussion (1974), pp. 25-46.

8) An interesting speculation is Bellman's (1970) "principle of optimality" which recommends itself *interalia* by being thoroughly intuitive. Optimum is based upon the feasibility of getting most expeditiously from here to there (finality being of the essence). Bellman sees the whole multi-stage decision procedure as representing a set of temporal trajectories that are effectively policies in a policy space. He hopes to use the dynamic programming of history (in "retrospective futurology") to approach hypotheses like "men's activities follow a path of least effort" through utilization of qualitative and quantitative variables. Calculations are made according to Zedah and Bellman's (1970) mathematical theory of "fuzzy environments." (Also Bellman and Smith, 1975) Although critics may attack these efforts as spin-offs of Asimov's psycho-historians in The Second Foundation, this modelling by constant aggregation and sampling seems no better or worse than other attempts to deal with "intuitive rationality." Bellman may sum up the state of the art by stating ". . . we know in advance that we can neither expect a perfect or a unique explanation . . . we are guided by the principle of Occam's razor, by esthetics and by intuition." (Wilkinson, et al., 1973, p. 15)

9) Steinbruner (1974) notes that the principle of consistency in psychology and that in formal logic are related but different notions. Psychological consistency relates to "secondary or higher order mental processes not tied to immediate perceptions . . ." (Ibid., p. 100)

10) The fact that a decision maker is able to observe the frequency of occurrence of reward for A and B does not mean that he treats this as a result of a random process. Cognitive theory expects the individual to impose an overall meaning to the sequence of reward. An example in a pure gambling game would be the player with the "system" to win.

11) By its own internal logic, the mind severs (under uncertainty) the lateral relationship between separate values and sets up separate decision problems each governed by a single value . . . (Steinbruner, 1974, p. 109).

12) Although outside the confines of this paper, mechanisms to maintain consistency have been hypothesized for organizational policy making based upon natural information channels, background of role incumbents, and the hierarchy where procedures operate. Steinbruner discussed grooved, uncommitted and theoretical thinking as "the most direct and immediately usable contribution . . . to the analysis of complex policy problems" (1974, pp. 124-136).

13) "Nondecisioning," taking no overt choice action, is assumed an act. (See Bachrach and Baratz, 1963)

14) For full consideration of this topic, a corrollary to this paper should be developed discussing the metaphysical implications of predictability and precedent as assumptions of rationality. Specifically: (1) the values of whether the lack of total predictability is due to limits in knowledge or a human freedom called "creativity"; (2) the values of whether patterns of past choice predetermine areas of perfect predictability or if human choice is never totally consistent. For an excellent discussion of determinism or relativism in choice assumptions, see Schumacher (1973, pp. 228-237).

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